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(54) Syringe

(57) A needle head 2 which mounts a needle on a syringe cylinder 1 is provided with an annular groove 21 which divides the needle head into a front and a rear portion 23, 24. A syringe cap 3 covering the needle is provided with an annular projection 33 to engage with the annular groove of the needle head. When the cap is turned to an angle relative to the axis of the needle head, the head breaks at the annular groove and the needle is enclosed permanently in the cap.

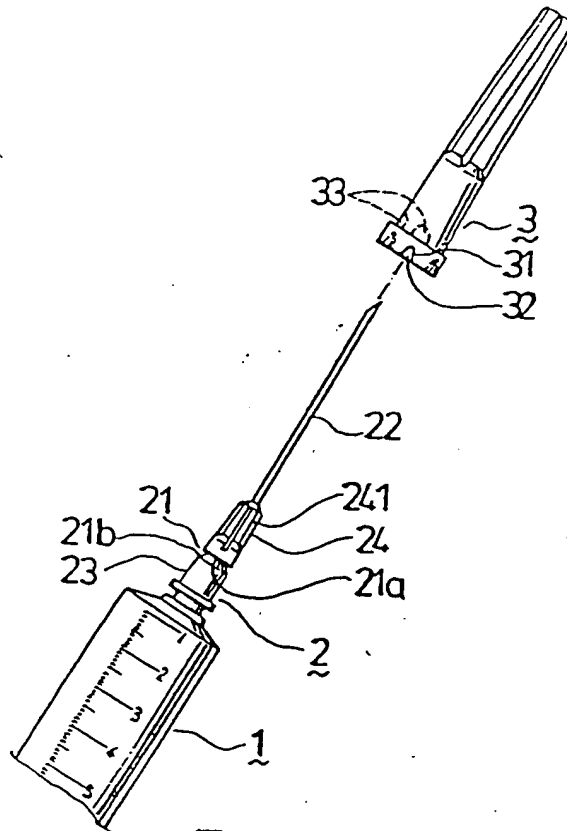


FIG. 1

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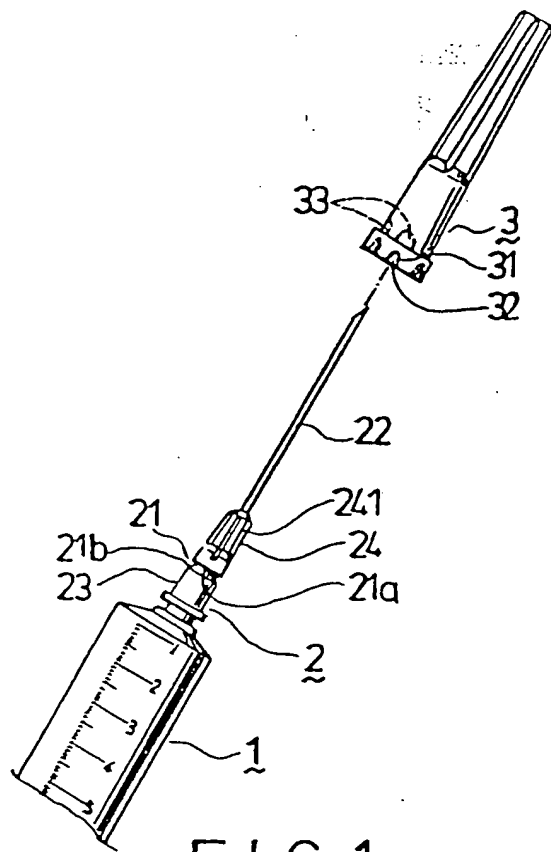


FIG. 1

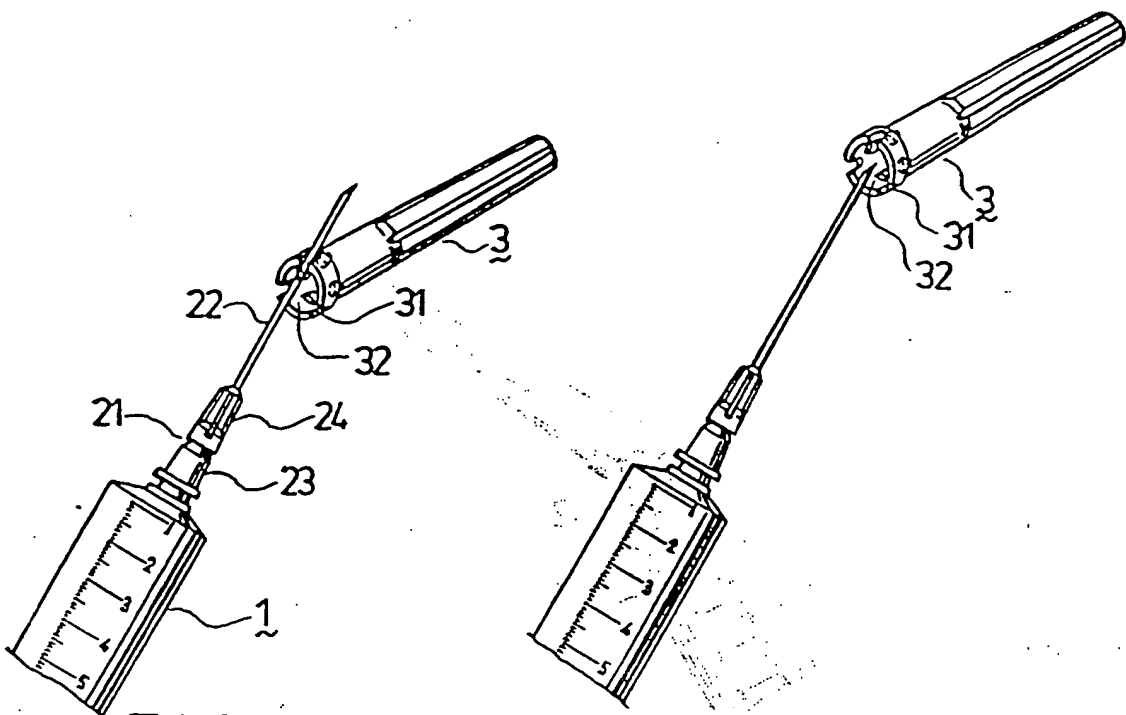


FIG. 2A

FIG. 2B

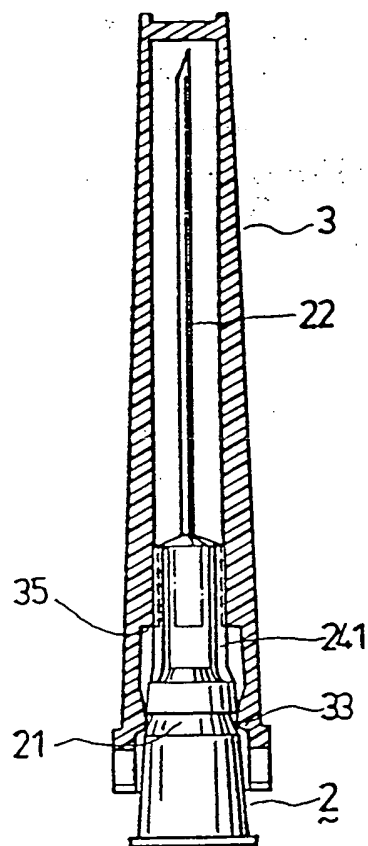


FIG. 3

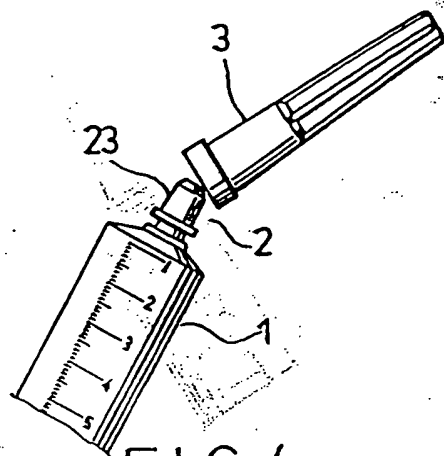


FIG. 4

SYRINGE

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This invention relates to a syringe, and particularly to a syringe having a syringe cap adapted to enclose and break a used syringe needle.

It is a common practice to use a syringe cap to permanently enclose the needle of a syringe once the syringe is used so as to avoid infection with a used syringe. A typical syringe cap includes an elongated housing which can cover up the syringe needle and engage with the needle head which is used to mount the needle on the cylinder of the syringe. Such a syringe cap has a disadvantage in that it can be removed easily from the needle so that a profiteer can reuse or resell the used syringe or the exposed needle could harm the person who disposes the waste. Furthermore, when the needle is inserted into the syringe cap, in many cases when not inserted properly, the needle harms the hand of the user.

An object of the invention is to provide a syringe with a syringe cap which can destroy a used needle and enclose it permanently therein to prevent it from contacting anybody.

Preferably the syringe cap has guide notches at its open end so as to enable one to easily insert the needle into the cap.

This invention provides a syringe which includes a

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a needle head having a front portion connected with a needle and a rear portion mounted on a syringe cylinder with a syringe cap which can engage unseparably with the needle head and cause the needle head to break 5 when the syringe cap is bent. The needle head is provided with an annular groove between the front portion and the rear portion thereof, and the syringe cap has an elongated enclosing wall with an annular projection to engage with the annular groove of the 10 needle head. The groove of the needle head is confined by a first annular flank which is adjacent to the front portion and which lies in a plane substantially perpendicular to the axis of the needle head and a second annular flank which is adjacent to the rear 15 portion and which has a frusto-conical surface. When the syringe cap is turned or bent relative to the axis of the needle head, the needle head breaks at the annular groove and the needle is permanently enclosed in the cap. The steep first flank prevents the disengaging 20 of the syringe cap from the needle head when the cap is bent.

Preferably, notches are provided at the open end of the syringe cap, each of the notches being out of alignment with the other 25 notches in a diametral direction. With these notches, one can insert easily and properly the needle of the syringe into the syringe cap.

The present exemplary preferred embodiment will be described in detail with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a syringe and a syringe cap incorporating the present invention;

Figs. 2A and 2B show how the syringe needle is put into the syringe cap with the aid of notches of the syringe cap;

Fig. 3 is a fragmentary sectional view showing that the syringe needle is capped; and

Fig. 4 shows how to bend the syringe needle.

Referring to the drawings, a syringe is shown, including a syringe cylinder 1, a needle head 2 which has a rear portion 23 mounted on the syringe cylinder 1 and a front portion 24 connected with a needle 22. Axial ridges 241 are provided on the front portion 24 of the needle head 2. According to the present invention, an annular groove 21 is further provided on the needle head 2 between the rear portion 23 and the front portion 24.

A syringe cap 3 is provided for covering the needle 22 and the needle head 2. At the inner side of the wall of the syringe cap 3 is provided axial projections 35 to define grooves adapted to engage with the ridges 241 of the needle head 2. According to

the invention, a projection 33 (suitably annular) on the inner wall of syringe cap 3 engages with the annular groove 21 of the needle head 2; preferably

notches 31 are provided at the open end of the syringe cap 3.

The annular groove 21 of the needle head 22 is confined by a first annular flank 21a which is adjacent to the front portion 24 and which lies in a plane substantially perpendicular to the axis of the needle head 22 and a second annular flank 21b which has a frusto-conical surface. When the cap is bent or turned to an angle relative to the axis of the needle head 2 as shown in Figure 4, the needle head 2 breaks at the groove 21 and the needle 22 is enclosed in the syringe cap 3 forever. The steep flank 21a of the groove, 21 provides an advantage in that the cap 3 does not disengage from the groove 21 when it is bent. Since the ridges 241 of the needle head 2 engage with the grooves of the syringe cap 3, the cap 3 is also prevented from rotation relative to the needle head 2.

The notches 31 of the syringe cap are provided in such a manner that each notch 32 is out of alignment with the others in a diametral direction. These notches 31 enable one to easily insert the needle 22 into the syringe cap 3. As shown in Figs. 2A and 2B, one may insert the needle 22 into the cap 3 by firstly receiving the needle 22 in a notch 32, then draw 22

pulling back the needle until the end of the needle reaches the opposite unnotched portion of the syringe cap and inserting the needle into the cap 3.

With the invention thus explained, it is apparent 5 that various modifications and variations can be made without departing from the scope of the invention. It is therefore intended that the invention be limited only as indicated in the appended claims.

CLAIMS:

1. A syringe comprising

a syringe cylinder,

a needle head having a front portion with longitudinal ridges thereon and a rear portion mounted on said syringe cylinder,

a needle attached to said front portion of said needle head,

a syringe cap for covering said needle and said needle head, having an elongated enclosing wall with its inner side being provided with longitudinal grooves to engage with said ridges of said needle head, a closed end and an open end, and

an improvement wherein said needle head includes an annular groove between said front and rear portions and is able to break at said annular groove upon being bent, said annular groove having a first annular flank which is adjacent to said front portion and which lies in a plane substantially perpendicular to the axis of said needle head and a second annular flank which is adjacent to said rear portion and which has a frusto-conical surface, and said syringe cap includes at its inner surface a projection to engage with said annular groove.

2. A syringe as claimed in Claim 1, wherein said syringe cap further includes notches provided at said open end, each of said notches being out of alignment

with the other said notches in a diametral direction.

3. A syringe substantially as described hereinbefore with reference to the accompanying drawings.

1. The applicant has not previously been granted a patent in the United States for the invention claimed in this application.

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